

Leu Ala Ser Arg Cys Arg Cys Cys Arg Pro Leu Thr Leu Ser Phe Ala Leu Cys
Trp Arg Val Glu Ala Ala Ala Ala Gly Arg Cys Arg \*\*\* His Phe His Trp Ala
Gly Ala Cys Lys Pro Leu Pro Leu Val Glu Ala Ala Asp Thr Phe Ile Gly Leu

3. TGG TCG CGT GAA GCC GTC GCC GTC GTG GAG CCG TCG CAG TCA CTT TTA CGG TTC

9 18 27 3G 45 54

5. ACC AGC GCA CTT CGG CAG CGG CAG CAC CTC GGC AGC GTC AGT GAA AAT GCC AAG

Thr Ser Ala Leu Arg Gln Arg Gln His Leu Gly Ser Val Ser Glu Asn Ala Lys
Pro Ala His Phe Gly Ser Gly Ser Thr Ser Ala Ala Ser Val Lys Met Pro Ser
Gln Arg Thr Ser Ala Ala Ala Ala Pro Arg Gln Arg Gln \*\*\* Lys Cys Gln Ala

Ser Phe Arg Gly Ala Val Gly Tyr Ser Thr Pro Thr ... Gly ... Tyr Asp Lys Leu Phe Ala Ala Arg Leu Gly Met Leu Pro Pro His Glu Gly Lys Ile Ile Arg Leu Phe Leu Pro Gly Cys Gly Trp Leu Leu His Thr Asn Val Arg Leu Leu Gly GTT CTT TTC GCC GGG CGT TGG GGT ATT CTC CAC CCA CAA GTG GGA ATT ATT AGG 63 72 81 90 99 108 CAA GAA AAG CGG CCC GCA ACC CCA TAA GAG GTG GGT GTT CAC CCT TAA TAA TCC Gln Glu Lys Arg Pro Ala Thr Pro ... Glu Val Gly Val His Pro ... Ser Lys Lys Ser Gly Pro Gln Pro His Lys Arg Trp Val Phe Thr Leu Asn Asn Pro Arg Lys Ala Ala Arg Asn Pro Ile Arg Gly Gly Cys Ser Pro Leu Ile Ile Leu

Arg Pro Pro Ser Phe Cys Phe Val Pro Ala Glu Leu Arg Gly Lys Gln Asn Asn Gly Leu Leu Leu Phe Val Phe Tyr Pro Leu Lys Trp Asp Gly Lys Lys Ile Ile Glu Ser Ser Ser Phe Phe Leu Ile Arg Ser Ser Gly Ile Glu Arg Lys Ser \*\*\*

AAG GCT CCT CCT CTT TTT GTT TTA TGC CCT CGA AGG TTA GAG GGA AAA ACT AAT 117 126 135 144 153 162

TTC CGA GGA GGA GAA AAA CAA AAT ACG GGA GCT TCC AAT CTC CCT TTT TGA TTA

Phe Arg Gly Gly Glu Lys Gln Asn Thr Gly Ala Ser Asn Leu Pro Phe \*\*\* Leu Ser Glu Glu Glu Lys Asn Lys Ile Arg Glu Leu Pro Ile Ser Leu Phe Asp Tyr Pro Arg Arg Arg Lys Thr Lys Tyr Gly Ser Phe Gln Ser Pro Phe Leu Ile Ile

Gln Lys His Arg Pro Leu Asn Pro Leu Pro Tyr Phe Glu Glu Gly Gly Pro Thr Lys Asn Thr Ala Leu Phe Thr Gln Phe Leu Thr Ser Ser Arg Val Glu Leu Pro Lys Thr Gln Pro Ser Ser Pro Lys Ser Ser Pro Leu Val Gly \*\*\* Arg Trp Pro Lys Thr Gln Pro Ser Ser Pro Lys Ser Pro Leu Val Gly \*\*\* Arg Trp Pro Lys Thr Gln Pro Ser Ser Pro Lys Ser Pro Leu Val Gly \*\*\* Arg Trp Pro Lys Thr Gln AAC ACC GCT CCT TCC AAA CCT TCT CCC ATC TTG AGG AGT GGA GGT CCC Lys Lys Lys Lys Lys Lys Lys Gly Gly Arg Gly Arg Gly \*\*\* Asn Ser Ser Pro Pro Gly Phe Val Cys Gly Glu Glu Gly Leu Glu Glu Gly Arg Thr Pro His Leu Gln Gly Leu Phe Val Ala Arg Lys Val Trp Lys Arg Val Glu Leu Leu Thr Ser Arg Gly

Gln Ser Asn Gln \*\*\* Ser Ala Ser Lys \*\*\* (ys Pro Ser Thr Thr Asn Gln His Lys Arg Ile Lys Ser Leu Leu Leu Ser Lys Val Leu His Leu Pro Ile Lys Thr Asn Ala Phe Lys Ala Leu Phe Cys Val Lys Leu Leu Thr Phe His Tyr Lys Pro CAA ACG CTT AAA ACG ATT CTT CGT/CTG AAA ATT GTT CCA CTT CAC CAT AAA ACC 225 234 243 252 261 270 GTT TGC GAA TTT TGC TAA GAA GCA GAC TTT TAA CAA GGT GAA GTG GTA TTT TGG Val Cys Glu Phe Cys \*\*\* Glu Ala Asp Phe \*\*\* Gln Gly Glu Val Val Phe Trp Phe Ala Asn Phe Ala Lys Lys Gln Thr Phe Asn Lys Val Lys Trp Tyr Phe Gly Leu Arg Ile Leu Leu Arg Ser Arg Leu Leu Thr Arg \*\*\* Ser Gly Ile Leu Val

Gly Ser Gly Cys Arg Ser Leu Ser Leu Phe Arg Gly Ala Ser Tyr Leu Ile Ser Gly Ala Ala Val Asp Leu Phe Arg Phe Ser Gly Val Leu Leu Ile Phe Phe Val Ala Arg Gln Trp Met Ser Phe Ala Phe Pro Val Ser Trp Cys Phe Leu Ser Tyr ACG GGC GAC GGT GTA GCT CTT TCG CTT TCC TTG GCT GGT CGT CTT ATT TCT TAT 279 288 297 306 315 324 TGC CCG CTG CCA CAT CGA GAA AGC GAA AGG AAC CGA CCA GCA GAA TAA AGA ATA Cys Pro Leu Pro His Arg Glu Ser Glu Arg Asn Arg Pro Ala Glu \*\*\* Arg Ile Ala Arg Cys His Ile Glu Lys Ala Lys Gly Thr Asp Gln Gln Asn Lys Glu Tyr Pro Ala Ala Thr Ser Arg Lys Arg Lys Glu Pro Thr Ser Arg Ile Lys Asn Thr

Cys Tyr Leu Leu Gly Cys Val \*\*\* Arg Thr His Leu Glu Ala Ser Gly Pro Ser Ala Thr Phe Phe Ala Val Tyr Lys Asp Leu Thr Ser Ser Arg Pro Val Leu Pro Gln Leu Leu Ser Pro Trp Het Ser Ile Ser His Pro Ala Gly Arg Phe Trp Pro GAC GTC ATT TCT TCC GGT GTA TGA ATA GCT CAC ACC TCG AGG CGC CTT GGT CCC 333 342 351 360 369 378 CTG CAG TAA AGA AGG CCA CAT ACT TAT CGA GTG TGG AGC TCC GCG GAA CCA GGG Leu Gln \*\*\* Arg Arg Pro His Thr Tyr Arg Val Trp Ser Ser Ala Glu Pro Gly Cys Ser Lys Glu Gly His Ile Leu Ile Glu Cys Gly Ala Pro Arg Asn Gln Gly Ala Val Lys Lys Ala Thr Tyr Leu Ser Ser Val Glu Leu Arg Gly Thr Arg Gly

Ala Cys Arg Gly Thr \*\*\* Gln Gln Ser Tyn Gly Lys Pro Ser Pro Thr Lys Pro
Leu Ala Ala Val Gln Arg Ser Ser His Thr Gly Lys Gln Leu Arg Pro Arg Gln
Phe Arg Leu Ser Arg Asp Val Ala Thr Leu Val Arg Lys Ser Val Pro Asp Lys

CTT CGC GTC GCT GGA CAG ATG ACG ACA CTC ATG GGA AAA CCT CTG CCC CAG AAA

387

GAA GCG CAG CGA CCT GTC TAC TGC TGT GAG TAC CCT TTT GGA GAC GGG GTC TTT

Glu Ala Gln Arg Pro Val Tyr Cys Cys Glu Tyr Pro Phe Gly Asp Gly Val Phe
Lys Arg Ser Asp Leu Ser Thr Ala Val Sen Thr Leu Leu Glu Thr Gly Ser Leu
Ser Ala Ala Thr Cys Leu Leu Leu \*\*\* Val Pro Phe Trp Arg Arg Gly Leu Trp

Ser Gln Leu Arg Ala Thr Glu Gln Leu Thr His Ser Phe Asn Gly Arg Ala Pro His Ser Tyr Gly Leu Leu Lys Arg Tyr Arg Ile His Ser Ile Glu Ala Pro Gln Thr Val Thr Ala Ser Cys Asn Gly Thr Val Tyr Thr Leu Phe Lys Arg Pro Ser CCA CTG ACA TCG GCT CGT CAA AGG ACA TTG CAT ACA CTC TTT AAA GGC GCC CGA 41 450 459 468 477 486 GGT GAC TGT AGC CGA GCA GTT TCC TGT AAC GTA TGT GAG AAA TTT CCG CGG GCT Gly Asp Cys Ser Arg Ala Val Ser Cys Asn Val Cys Glu Lys Phe Pro Arg Ala Val Thr Val Ala Glu Gln Phe Pro Val Thr Tyr Val Arg Asn Phe Arg Gly Leu Leu Pro Ser Ser Phe Leu Arg Met Glu Ile Ser Ala Gly Trp

Gln Val Lys Ser Leu Ser Arg Ser Ser Ala Ala Ala His Asn Ser Ser Leu Gln Ser Phe Lys Gln Phe His Ala Pro Leu His Leu Leu Thr Ile Pro Leu Cys Ser Ala Ser Ser Lys Phe Thr Leu Pro Phe Ile Cys Cys Arg Ser Gln Phe Val Ala CCG ACT TGA AAA CTT TCA CTC GCC CTT CTA CGT CGT CGC ACT AAC CTT CTG TCG 495 504 513 522 531 540 GGC TGA ACT TTT GAA AGT GAG CGG GAA GAT GCA GCA GCG TGA TTG GAA GAC AGC Gly \*\* Thr Phe Glu Ser Giu Arg Glu Asp Ala Ala Ala \*\* Leu Glu Asp Ser Ala Glu Leu Leu Lys Val Ser Gly Lys Met Gln Gln Arg Asp Trp Lys Thr Ala Leu Asn Phe \*\* Lys \*\* Ala Gly Arg Cys Ser Ser Val Ile Gly Arg Gln Leu

FIGURE 2 (continuation 1)

Val Arg \*\*\* Leu Pro Gly Ala Arg Asn His Ser Ser Gly Thr Pro Gly Tyr Asn Tyr Val Asp Tyr His Ala Arg Gly Thr Thr Pro Leu Ala Leu Pro Gly Thr Ile Thr Cys Thr Met Thr Pro Gly Gly Pro Gln Pro Phe Leu Trp His Ala Arg Leu ACA TGT GCA GTA TCA CCC GGG CGG GCC AAC ACC CTT CTC GGT CAC CCG GGC ATT S49 S58 S67 S76 S85 S94 TGT ACA CGT CAT AGT GGG CCC GGC CGG TTG TGG GAA GAG CCA GTG GGC CCG TAA Cys Thr Arg His Ser Gly Pro Ala Arg Leu Trp Glu Glu Pro Val Gly Pro Val His Val Ile Val Gly Pro Pro Gly Cys Gly Lys Ser Gln Trp Ala Arg Asn Tyr Thr Ser \*\*\* Trp Ala Arg Pro Val Val Gly Arg Ala Ser Gly Pro Val Ile

Gln Gln Ala \*\*\* Pro Cys Arg Ser Ser Ala \*\*\* Tyr Phe Tyr Thr Thr Pro His Lys Ser Leu Arg Pro Val Gly Val Pro Leu Arg Thr Ser Ile Leu Pro Pro Ile Lys Ala Ser Gly Leu Ser Val \*\*\* Gln Phe Gly Leu Leu Phe Leu His His Ser AAA ACG ACT CGG ATC CCT GTG GAT GAC CTT CGG ATC ATC TTT ATT CAC CAC CCT 603 612 630 639 648

TTT TGC TGA GCC TAG GGA CAC CTA CTG GAA GCC TAG TAG AAA TAA GTG GTG GGA Phe Cys \*\*\* Ala \*\*\* Gly His Leu Leu Glu Ala \*\*\* Lys \*\*\* Val Val Gly Phe Ala Glu Pro Arg Asp Thr Tyr Trp Lys Pro Ser Arg Asn Lys Trp Trp Asp Leu Leu Ser Leu Gly Thr Pro Thr Gly Ser Leu Val Glu Ile Ser Gly Gly Het

Ile Asp His Leu Leu Gln Gln Lys Pro His Asn Lys His Ser Thr Val Lys Ser Ile Het Ser Phe Phe Asn Asn Asn Gln Ile Ile Lys Ile Ala Pro \*\*\* Arg Pro Tyr \*\*\* Pro Ser Ser Thr Thr Thr Lys Ser Ser Lys \*\*\* Pro Gln Asn Gly ACC TAT AGT ACC TCT TCT TCA ACA ACA AAA CCT ACT AAA AAT ACC GAC CAA TGG 657 666 675 684 693 702 TGG ATA TCA TGG AGA AGA AGT TGT TGT TGT GGA TGA TTT TTA TGG CTG GTT ACC Trp Ile Ser Trp Arg Arg Ser Cys Cys Phe Gly \*\*\* Phe Leu Trp Leu Val Thr Gly Tyr His Gly Glu Glu Val Val Leu Asp Asp Phe Tyr Gly Trp Leu Pro Asp Ile Het Glu Lys Lys Leu Leu Phe Trp Met Ile Phe Met Ala Gly Tyr Leu

Pro His Asp Val Ser Val Thr His Gly Thr Asp Het Ser Gln Leu Ser \*\*\* Leu Pro Ile Ile \*\*\* Gln Ser Gln Thr Val Pro Ile Trp Gln Ser Tyr Leu Ser Phe Gln Ser Ser Arg Ser Leu Ser His Ser Arg Tyr Gly Asn Val Thr Ser Val Leu AAC CCT ACT AGA TGA CTC TGA CAC ACT GGC CAT AGG TAA CTG ACA TCT CTG ATT 711 720 729 738 747 756

TTG GGA TGA TCT ACT GAG ACT GTG TGA CCG GTA TCC ATT GAC TGT AGA GAC TAA

Leu Gly \*\*\* Ser Thr Glu Thr Val \*\*\* Pro Val Ser Ile Asp Cys Arg Asp \*\*\*

Trp Asp Asp Leu Leu Arg Leu Cys Asp Arg Tyr Pro Leu Thr Val Glu Thr Lys Gly Het Ile Tyr \*\*\* Asp Cys Val Thr Gly Ile His \*\*\* Leu \*\*\* Arg Leu Lys

Pro Tyr Gln Glu Lys Lys Pro Gly Cys Tyr Lys Ser \*\*\* Trp Cys Asp Pro Gly Pro Thr Ser Asn Arg Lys Gln Gly Ala Thr Asn Gln Asn Gly Ala Ile Leu Gly Pro Pro Val Thr Gly Lys Lys Ala Arg Leu Ile Lys Ile Val Leu Leu \*\*\* Ala TCC CCC ATG ACA AGG AAA AAA CCG GGC GTC ATA AAA CTA ATG GTC GTT AGT CCG 765 774 783 792 801 810 AGG GGG TAC TGT TCC TTT TTT GGC CCG CAG TAT TTT GAT TAC CAG CAA TCA GGC Arg Gly Tyr Cys Ser Phe Phe Gly Pro Gln Tyr Phe Asp Tyr Gln Gln Ser Gly Gly Gly Thr Val Pro Phe Leu Ala Arg Ser Ile Leu Ile Thr Ser Asn Gln Ala Gly Val Leu Phe Leu Phe Trp Pro Ala Val Phe \*\*\* Leu Pro Ala Ile Arg Pro

Gly Pro Ile Thr Ser Arg Leu Gln Gln Gly Leu Gln Leu Leu Glu Arg Asp Ser Gly Leu Phe Pro Val Gly \*\*\* Ser Ser Asp Trp Ser Tyr Phe Ser Glu Ile Pro Gly Trp Ser His Tyr Glu Glu Val Ala Thr Gly Ala Thr Ser Ala Arg ... Arg GGG GGT CCT TAC CAT GAG GAG TTG ACG ACA GGG TCG ACA TCT TCG AGA GAT AGC 319 828 837 846 855 864 CCC CCA GGA ATG GTA CTC CTC AAC TGC TGT CCC AGC TGT AGA AGC TCT CTA TCG Pro Pro Gly Met Val Leu Leu Asn Cys Cys Pro Ser Cys Arg Ser Ser Leu Ser Pro Gln Glu Trp Tyr Ser Ser Thr Ala Val Pro Ala Val Glu Ala Leu Tyr Arg Pro Arg Asn Gly The Pro Gla Leu Leu Ser Gla Leu \*\*\* Lys Leu Ser Ile Gly Ser \*\*\* \*\*\* Lys Ala Ile Lys Ser Ser Gln Gln Leu Val Ile Trp Pro Pro Val Pro Asn Ser Ser Gln Leu Lys Pro Leu Ser Ser Ser Phe Leu Gly Arg Leu Tyr Leu Ile Val Val Lys Cys Asn Gln Phe Val Ala Pro Ser Cys Asp Val Ser Thr CTC CTA ATG ATG AAA CGT TAA AAC CTT CTG ACG ACC TCT TGT TAG GTG CCT CCA 873 891 882 900 909 918 GAG GAT TAC TAC TTT GCA ATT TTG GAA GAC TGC TGG AGA ACA ATC CAC GGA GGT Glu Asp Tyr Tyr Phe Ala Ile Leu Glu Asp Cys Trp Arg Thr Ile His Gly Gly Arg Ile Thr Thr Leu Gln Phe Trp Lys Thr Ala Gly Glu Gln Ser Thr Glu Val Gly Leu Leu Cys Asn Phe Gly Arg Leu Leu Glu Asn Asn Pro Arg Arg Tyr Arg Leu Gly Ile Gln Leu Leu Pro Gly Val Arg His Gly Lys Gly Het Tyr Phe Gly Phe Ala Ser Lys Phe Cys His Val/Trp Gly Thr Gly Lys Glu Trp Ile Phe Gly Ser Pro Arg Asn Ser Ala Thr Ser Gly Gly Gln Ala Arg Lys Gly Tyr Leu TGG GCT TCC GGC TAA ACT TCG TCA CCT GGG TGG GAC ACG GGA AAA GGG TAT ATT 927 936 945 954 963 972 ACC CGA AGG CCG ATT TGA AGC AGT GGA CCC ACC CTG TGC CCT TTT CCC ATA TAA --- --- --- --- --- --- ---Thr Arg Arg Pro Ile \*\*\* Ser Ser Gly Pro Thr Leu Cys Pro Phe Pro Ile \*\*\* Pro Glu Gly Arg Phe Glu Ala Val Asp Pro Pro Cys Ala Leu Phe Pro Tyr Lys Pro Lys Ala Asp Leu Lys Gln Trp Thr His Pro Val Pro Phe Ser His Ile Lys Leu Asn Ser Leu Arg Lys Gln \*\*\* 10 Het Thr Ile Thr Lys Ile Lys Ile \*\*\* Tyr Ile Val Ser Asp Lys Lys Asn Asp Cys Arg Leu Pro Lys ••• Lys ••• Glu Ile Phe ••• Gln Thr Lys Lys Thr Ile Vol Asp Tyr His Asn Lys Asn Lys Asn TTA TTT AAT GAC TCA GAA AAA ACA ATA GTG TAG CAT TAC CAA AAA TAA AAA TAA 981 990 999 1008 1017 1026 AAT AAA TTA CTG AGT CTT TTT TGT TAIT CAC ATC GTA ATG GTT TIT ATT TTT ATT - --- --- --- --- --- --- ---Asn Lys Leu Leu Ser Leu Phe Cys Tyr His Ile Val Het Val Phe Ile Phe Ile Ile Asn Tyr \*\*\* Val Phe Phe Val Ile Thr Scr \*\*\* Trp Phe Leu Phe Leu Phe ••• Ile Thr Glu Ser Phe Leu Leu Ser His Arg Asn Gly Phe Tyr Phe Tyr Ser Lys Ser Pro Arg Glu Pro Tyr Ile Arg Gln Ile Thr Cys Leu Tyr Asp Val Lys Ash Leu Pro Asp Lys Leu Ile Phe Glu Arg Phe Gln Vol Tyr Ile Thr Leu Arg Met ... Leu Thr Lys ... Ser Leu Asn Glu Ser Asn Tyr Het Phe Leu ... Gly --- ---GTA AAT CTC CCA GAA AGT CCT ATT TAA GAG ACT TAA CAT GTA TIT ATC AGT TGG 1035 1044 053 1062 1071

FIGURE 2 (continuation 3)

--- --- --- --- --- --- ---

CAT TTA GAG GGT CTT TCA GGA TAA/ATT CTC TGA ATT GTA CAT AAA TAG TCA ACC

His Leu Glu Gly Leu Ser Gly \*\*\* Ile Leu \*\*\* Ile Val His Lys \*\*\* Ser Thr Ile \*\*\* Arg Val Phe Gln Asp Lys Phe Ser Glu Leu Tyr Ile Asn Ser Gln ProPhe Arg Gly Ser Phe Arg Ile Asn Ser Leu Asn Cys Thr \*\*\* Ile Val Asn Leu

Gly Cys Leu Lys Pro Ser His Asn Cys Lys Pro Ala Cys Leu Gly Pro Arg His Val Val Tyr Asn Gln Ala Thr Thr Ald Asn Gln Leu Ala Tyr Gly Leu Gly Thr Trp Het Ile Lys Pro Gln Pro Gln Met Lys Ser Arg Het Ala Trp Ala Gln AAT GGT GTA TTA AAA CCC GAC ACC AAC GTA AAA CCT CGC GTA TCG GGT CCG GAC 1089 1098 1107 1116 1125 1134

TTA CCA CAT AAT TTT GGG CTG TGG TTG CAT TTT GGA GCG CAT AGC CCA GGC CTG

Leu Pro His Asn Phe Gly Leu Trp Leu His Phe Gly Ala His Ser Pro Gly Leu Tyr His Ile Ile Leu Gly Cys Gly Cys Ile Leu Glu Arg Ile Ala Gln Ala Cys Thr Thr \*\*\* Phe Trp Ala Val Val Ala Phe Trp Ser Ala \*\*\* Pro Arg Pro Val

Ala Arg Cys Gln His Pro Tyr Lys Phe Pro Ala Val Ala Pro Lys Lys \*\*\* \*\*\*

His Glu Val Asn Thr His Thr Asn Leu His Leu Trp Leu Gln Asn Arg Lys Asn

Thr Ser Ser Met Pro Thr Pro Ile \*\*\* Ile Ser Gly Cys Ser Thr Glu Lys Ile

ACA CGA GCT GTA ACC ACA CCC ATA AAT TTA CCT CGG TGT CGA CCA AAG AAA ATA

1143 1152 1161 1170 1179 1188

TGT GCT CGA CAT TGG TGT GGG TAT TTA AAT GGA GCC ACA GCT GGT TTC TTT TAT

Cys Ala Arg His Trp Cys Gly Tyr Leu Asn Gly Ala Thr Ala Gly Phe Phe Tyr

Val Leu Asp Ile Gly Val Gly Ile \*\*\* Met Glu Pro Gln Leu Val Ser Phe Ile

Cys Ser Thr Leu Val Trp Val Phe Lys Trp Ser His Ser Trp Phe Leu Leu

Lys Ala Pro Val Leu \*\*\* Asn Asn Pro Arg Ala Arg Thr Gln Pro His Leu Val Asn Pro Gln Phe Trp Asp Ile Thr Gln Asp Leu Glu Pro Lys Pro Thr Phe Tyr Ile Gln Ser Ser Gly Ile Leu Gln Lys Thr ... Ser Gln Asn Pro Pro Ser Thr ATA AAC CGA CCT TGG TTA GTT AAC AAA CCA GAT CGA GAC CAA ACC CCC ACT. TCA 1215 1197 1206 1224 1233 1242 TAT TTG GCT GGA ACC AAT CAA TTG TTT GGT CTA GCT CTG GTT TGG GGG TGA AGT --- --- --- --- --- ---Tyr Leu Ala Gly Thr Asn Gln Leu Phe Gly Leu Ala Leu Val Trp Gly \*\*\* Ser Ile Trp Leu Glu Pro Ile Asn Cys Leu Val \*\*\* Leu Trp Phe Gly Gly Glu Val Phe Gly Trp Asn Gln Ser Ile Val Trp Ser Ser Gly Leu Gly Val Lys Tyr

Gin Leu Pro Leu Tyr Leu Ala Ala Lys His His Pro Pro Leu Leu Leu \*\*\* Tyr Arg Ser His Tyr Thr Phe Pro Gin Arg Ile Thr His Arg Ser Ser Tyr Asn Ile Gly Pro Thr Thr Pro Leu Pro Ser Gly \*\*\* Pro Thr Ala Pro Pro Thr Thr Leu TGG ACC TCA CCA TCC ATT TCC CGA CGG AAT ACC ACA CCG CCC TCC TCA TCA ATT 1251 1260 1269 1278 1287 1296 ACC TGG AGT GGT AGG TAA AGG GCT GCC TTA TGG TGT GGC GGG AGG AGT AGT TAA Thr Trp Ser Gly Arg \*\*\* Arg Ala Ala Leu Trp Cys Gly Gly Arg Ser Ser \*\*\* Pro Gly Val Val Gly Lys Gly Leu Pro Tyr Gly Val Ala Gly Gly Val Val Asn Leu Glu Trp \*\*\* Val Lys Gly Cys Leu Met Val Trp Arg Glu Glu \*\*\* Leu Ile

Leu Pro \*\*\* Leu Gly Leu Gln His Leu Pro Asn Cys Leu Gln Cys Gly Leu Tyr Tyr Pro Asp Tyr Ala Leu Asn Thr Ser Pro Thr Val Phe Asn Ala Asp Leu Ile Ile Pro Thr Het Pro Trp Thr Pro Pro Pro Pro Pro teu Thr Pro Met Trp Ser . ... ... ... ... ... ... ... ... ATA TCC CCA GTA TCC GGT TCA ACC ACC TCC CCC AAT GTT TCA ACC GTA GGT TCT 1305 1314 1323 1341 1332 1350 TAT AGG GGT CAT AGG CCA AGT TGG TGG AGG GGG TTA CAA AGT TGG CAT CCA AGA .h- --- --- --- --- --- --- --- ---Tyr Arg Gly His Arg Pro Ser Top Trp Arg Gly Leu Gla Ser Trp His Pro Arg The Gly Val The Gly Gln Val Gly Gly Gly Gly Tyr Lys Val Gly The Gln Asp ••• Gly Ser ••• Ala Lys Lew Val Glu Gly Val Thr Lys Lou Ala Ser Lys Ile Cys Cys His Val Trp Cys Arg Lys Ser ... Leu His His Pro Arg Gln Pro Leu Val Val Thr Ser Gly Val Gly Arg Gln Asn Ser Thr Ile Pro Asp Arg Pro Tyr Leu Leu Leu Pro Gly Leu Val Glu Lys Ile Leu Pro Ser Pro Thr Glu Pro Thr ATT GTT GTC ACC TGG GTT GTG GAG AAA CTA ATC TCC ACT ACC CCA GAG ACC CCA 1359 1368 1377 1386 1395 1404

TAA CAA CAG TGG ACC CAA CAC CTC TTT GAT TAG AGG TGA TGG GGT CTC TGG GGT

... Gln Gln Trp Thr Gln His Leu Phe Asp ... Arg ... Trp Gly Leu Trp Gly Asn Asn Ser Gly Pro Asn Thr Ser Leu Ile Arg Gly Asp Gly Val Ser Gly Val Thr Thr Val Asp Pro Thr Pro Leu ... Leu Glu Val Met Gly Ser Leu Gly ...

Ite \*\*\* Ite \*\*\* Gly Lys \*\*\* Tyr Pro Leu Ite Pro Phe Thr Pro Thr Pro Pro Phe Glu Tyr Lys Ala Lys Arg Ite Arg Tyr Tyr Gln Phe Pro Leu Pro Leu Pro Phe Asn Met Asn Leu Arg Glu Leu Val Thr Thr Asn Ser Leu Tyr Pro Tyr Pro TTT TAA GTA TAA ATC GGA AAG ATT ATG CCA TCA TAA CCT TTC CAT CCC CAT CCC 1413 1422 1431 1440 1449 1458 AAA ATT CAT ATT TAG CCT TTC TAA TAC GGT AGT ATT GGA AAG GTA GGG GTA GGG Lys Ite His Ite \*\*\* Pro Phe \*\*\* Tyr Gly Ser Ite Gly Lys Val Gly Val Gly Lys Phe Ite Phe Ser Leu Ser Asn Thr Val Val Leu Glu Arg \*\*\* Gly \*\*\* Gly Asn Ser Tyr Leu Ala Phe Leu Ite Arg \*\*\* Tyr Trp Lys Gly Arg Gly Arg Gly

Gln His Arg Arg Leu Pro Pro Pro Val Pro Arg His Gln Ile Glu Ala Arg \*\*\*

Asn Thr Gly Gly Ser Pro Pro Leu Phe Gln Gly Ile Asn Phe Arg Leu Glu Asn
Thr Pro Ala Ala Gln Pro Pro Ser Ser Ser Ala Ser Thr Ser Asp \*\*\* Ser Thr

CCA ACC ACG GCG GAC TCC CCC CCT CCT TGA CCG GCT ACA ACT TAG AGT CGA GCA

1467 1476 1485 1494 1503 1512

GGT TGG TGC CGC CTG AGG GGG GGA GGA ACT GGC CGA TGT TGA ATC TCA GCT CGT

Gly Trp Cys Arg Leu Arg Gly Gly Gly Thr Gly Arg Cys \*\*\* Ile Ser Ala Arg
Val Gly Ala Ala \*\*\* Gly Gly Glu Glu Leu Ala Asp Val Glu Ser Gln Leu Val
Leu Val Pro Pro Glu Gly Gly Arg Asn Trp Pro Met Leu Asn Leu Ser Ser Leu

Cys Glu Leu Ile Ala Ala Leu Thr Ang Arg Lys His His Thr Cys Ile Arg \*\*\*

Val Asn Trp Ser Pro Gln Ser His Gly Gly Arg Ile Thr Leu Val Phe Glu Arg

Leu Met Gly Leu His Ser Arg Thr Asp Glu Glu \*\*\* Pro Ser Tyr Leu Asn Glu

ATT GTA AGG TTC TAC CGA CGC TCA CAG GAG GAG AAT ACC ACT CAT GTT TAA GAG

1521 1530 1539 1548 1557 1566

TAA CAT TCC AAG ATG GCT GCG AGT GTC CTC CTC TTA TGG TGA GTA CAA ATT CTC

\*\*\* His Ser Lys Met Ala Ala Ser Val Leu Leu Leu Trp \*\*\* Val Gln Ile Leu

Asn Ile Pro Arg Trp Leu Arg Val Ser Ser Ser Tyr Gly Glu Tyr Lys Phe Ser

Thr Phe Gln Asp Gly Cys Glu Cys Pro Pro Leu Met Val Ser Thr Asn Ser Leu

Phe Pro Pro Phe Gln Leu Tyr Gly Asp Lys Pro Ala Met Gln Leu Pro Lys Gln Ser Leu Arg Ser Asn Phe Ile Gly Thr Lys Arg Arg Trp Arg Tyr Arg Asn Arg Leu Phe Ala Pro Ile Ser Ser Val Arg Arg Glu Alo Gly Asp Thr Val Thr Glu ATC TTT CCG CCC TTA ACT TCT ATG GGC AGA AAG CCG CGG TAG ACA TTG CCA AAG 1575 1584 1593 1602 1611 1620 TAG AAA GGC GGG AAT TGA AGA TAC CCG TCT TTC GGC GCC ATC TGT AAC GGT TTC Lys Gly Gly Asn \*\*\* Arg Tyr Pro Ser Phe Gly Alo Ile Cys Asn Gly Phe Arg Lys Alo Gly Ile Glu Asp Thr Arg Leu Ser Alo Pro Ser Val Thr Val Ser Glu Arg Arg Glu Leu Lys Ile Pro Val Phe Arg Arg His Leu \*\*\* Arg Phe Leu

Leu Arg Pro Thr Gly Phe Ile Thr Lys Glu Pro Pro His Lys Trp Ser Pro Gla Phe Ala Pro His Val Leu Tyr Pro Arg Arg Arg Leu Ile Asa Gly Leu His Ser Ser Pro Pro Thr Tyr Trp Ile His Asp Glu Gly Ser Ser Thr Glu Leu Ile Ala ACT TCC GCC CCA CAT GGT TTA TAC CAG AAG AGG CCT CCT ACA AAG GTT CTA CCG 1629 1638 1647 1656 1665 1674
TGA AGG CGG GGT GTA CCA AAT ATG GTC TTC TCC GGA GGA TGT TTC CAA GAT GGC \*\*\* Arg Arg Gly Val Pro Asa Met Val Phe Ser Gly Gly Cys Phe Gla Asp Gly Glu Gly Gly Val Tyr Gla Ile Trp Ser Ser Pro Glu Asp Val Ser Lys Met Alalys Ala Gly Cys Thr Lys Tyr Gly Leu Leu Arg Arg Met Phe Pro Arg Trp Leu

Pro Pro Asp Thr Lys Gln Pro Leu Ala Glu Lys Ala Val Asp Asp \*\*\* Leu Arg Pro Arg Thr Arg Arg Arg Arg Tyr Arg Arg Pro Trp Thr Het Arg Tyr Ala Pro Ala Pro Gly Asp Glu Ala Thr Val Gly Gly Gln Gly Arg \*\*\* Gly Ile ACG CCC CCG CCC AGG CAG AAG ACG CCA TTG CGG AGG AAC CGG TGC AGT AGG ATA 1683 1692 1701 1710 1719 1728
TGC GGG GGC GGG TCC GTC TTC TGC GGT AAC GCC TCC TTG GCC ACG TCA TCC TAT Cys Gly Gly Gly Ser Val Phe Cys Gly Asn Ala Ser Leu Ala Thr Ser Ser Tyr Ala Gly Ala Gly Pro Ser Ser Ala Val Thr Pro Pro Trp Pro Arg His Pro Ile Arg Gly Arg Val Arg Leu Leu Arg \*\*\* Arg Leu Leu Gly His Val Ile Leu \*\*\*

Leu Ser Leu Leu Ala Ser Ser Tyr Tyr
Phe His Phe Phe His Ala Ala Thr Thr Asn
Phe Thr Phe Ser Thr Arg Gln Gln Leu Ile

TTT TCA CTT TCT TCA CGC GAC GAC ATC ATA A 5:

1737 1746 1755

AAA AGT GAA AGA AGT GCG CTG CTG TAG TAT T 3:

Lys Ser Glu Arg Ser Ala Leu Leu \*\*\* Tyr
Lys Val Lys Glu Val Arg Cys Cys Ser Ile
Lys \*\*\* Lys Lys Cys Ala Ala Val Val

	-	
circopormank circopormeeh circopordfp	10 20 30 40 50  1 ACCAGCGCAC FTCGGCAGCG GCAGCACCTC GGCAGCGTCA GTGAAAATGC 1 ACCAGCGCAC FTCGGCAGCG GCAGCACCTC GGCAGCGTCA GTGAAAATGC 1 ACCAGCGCAC FTCGGCAGCG GCAGCACCTC GGCAGCGTCA GTGAAAATGC	50 50 50
circopormank circopormeeh circopordfp	51 CAAGCAAGAA AAGCGGCCCG CAACCCCATA AGAGGTGGGT STTCACCCTT	100 100 100
circopormank circopormeeh circopordfp	101 GATAATCCTT CCGAGGAGGA GAAAAACAAA GTACGGGAGC TTCCAATCTC	150 150 150
circopormank circopormeeh circopordfp	151 CCTTTTGAT CATTTGTTT GCGGAGAGGA AGGTTTGGAA GAGGGTAGAA	200 200 200
circopormank circopormeeh circopordfp	201 STOCTCACCT CCAGGGGTTT SCGAATTITG STAAGAAGCA GACTTTTAAC	250 250 250
circopormank circopormeeh circopordfp	251 AAGGTGAAGT GGTATTTTGG FGCCCGCTGC CACATCGAGA AAGCGAAAGG	300 300 300
circopormank circopormeeh circopordfp	301 HACCGACCAG CAGAATAAAG HATACTGCAG TAAAGAAGGC CACATACTTA	350 350 350
circopormank circopormeeh circopordfp	351 TCGAGTGTGG AGCTCCGCGG AACCAGGGGA AGCGCAGCGA CCTGTCTACT	400 400 400
circopormank circopormeeh circopordfp	401 GETGTGAGTA CCCTTTTGGA GACGGGGTCT FTGGTGACTG FAGCCGAGCA	450 450 450
circopormank circopormeeh circopordfp	451 STTCCCTGTA ACGTATGTGA GAAATTTCCG CGGGCTGGCT GAACTTTTGA	500 500 500
circopormank circopormeeh circopordfp	501 LAGTGAGEGG GAAGATGEAG CAGEGTGATT GGAAGACAGE FGTACAEGTE	550 550 550
circopormank circopormeeh circopordfp	560 570 580 590 600  551 TAGTGGGCC GCCCGGTTG TGGGAAGAGC CAGTGGGCCC GTAATTTTGC  551 TAGTGGGCC CGCCCGGTTG TGGGAAGAGC CAGTGGGCCC GTAATTTTGC  551 TAGTGGGCC CGCCCGGTTG TGGGAAGAGC CAGTGGGCCC GTAATTTTGC	600 600 600

	610 620 630 640 650	
Circopormank	601 IGAGCCTAGE GACACCTACT GGAAGCCTAG FAGAAATAAG FGGTGGGATG 6	50
Circopormeeh Circopordfp	601 IGAGECTAGG GACACCTACT GGAAGCCTAG TAGAAATAAG TGGTGGGATG 6	50
Ctrcoporarp	601 IGAGCCTAGG SACACCTACT GGAAGCCTAG TAGAAATAAG IGGTGGGATG 6	50
	660 670 680 690 700	
circopormank	700	
circopormech	651 GATATGATGG AGAAGAAGTT GTYCTTYCC ATCHTON OF COMMENT	00
circopordfp	est arrayered devices a large to the second of the second	00
• •	STOTION TOUTEN	99
	710 720 730 740 750	
circopormank	701 SCTTGGGATG ATCTACTGAG ACTGTGTGAC EGGTATCCAT TGACTGTAGA 75	50
circopormeeh		SO
circopordfp	701 CCTTGGGATG ATCTACTGAG ACTGTGTGAC CGGTATCCAT TGACTGTAGA 7	50
·	760 770 780 790 800	
circopormank		30
circopormeeh	751 ZICHARGE ZERIGERE TERRETARI STANDARD TO THE STANDARD TO TH	00 00
circopordfp	751 GACTAAAGGG GGTACTGTTC CTTTTTTGGC CCGCAGTATT TTGATTACCA 80	
ciaconomant	810 820 830 840 850	
circopormank circopormeeh	801 GCAATCAGGC CCCCAGGAA IGGTACTCCT CAACTGCTGT CCCAGCTGTA 85 801 GCAATCAGGC CCCCCAGGAA IGGTACTCCT CAACTGCTGT CCCAGCTGTA 85	
circopordfp	801 GCAATCAGGC CCCCCAGGAA TGGTACTCCT CAACTGCTGT CCCAGCTGTA 88	
ctr copora.p	801 GCAATCAGGC CCCCCAGGAA IGGTACTCCT CAACTGCTGT CCCAGCTGTA 85	90
	860 870 880 890 900	
circopormank	851 SAAGGIGIGI STEGGAGGAT PAGTAGETIG SANTETIGGA GGAGTGGTGG	10
circopormeeh	851 GAAGCTCTCT ATCGGAGGAT FACTACTITIG CAATTITIGGA AGACTGCTGG 90	
circopordfp	851 GAAGCTCTCT ATCGGAGGAT FACTACTITG CAATTITGGA AGACTGCTGG 90	
circopormank	910 920 930 940 950 901 <u>1744-441-4</u> <u>1477477444 447477444 44747444 447474444 95</u>	
circopormeeh		
circopordfp		
C., Copo. 0. p	901 STANGARIES ACCORDINATE ACCORDINATE STANGARICA STRUCTURE 95	90
	960 970 980 990 1000	
circopormank	951 SCTGTGCCCT TTTCCCCATAT AAAATAAATT SCTGAGTCTT HTTTGTTATC 100	90
circopormeeh	951 CETGTGCCCT FTTCCCATAT AAAATAAATT ACTGAGTCTT FTTTGTTATC 100	96
circopordfp	951 CCTGTGCCCT TTTCCCATAT MANATANATT SCTGAGTCTT TTTTGTTATC 100	96
	1010 1020 1030 1040 1050	
circopormank	100.	- 0
circopormeeh	1001 CATCGTAAT GGTTTTATT TTATTTATT TAGAGGGTCT TTTAGGATAA 105	
circopordfp	1001 SCATEGIAAT GGTTTTATT TTTATTESTT TAGAGGGTCT TTESGGATAA 105	
		,0
	1060   1070   1080   1090   1100	
circopormank	1051 ATTETETGAA FIGTACATAA ATAGTCAGCC FTACCACATA ATTTTGGGGT 116	30
circopormeeh	1051 STICTCIGAA FIGTACATAA STAGTCAGCC TTACCACATA STITTGGGCT 110	90
circopordfp.	1051 STICTCTGAA FIGTACATAA STAGTCARCC TTACCACATA STITTGGGCT 110	90
•	1110	
circopormank	1101 GIGGETGEAT FITTGGAGEGE STAGEEGAGG ZETGTGTGET SGACATTIGGT 119	50
circopormeeh	1101 STGGCTGCAT ITTGGAGCGC ATAGCCGAGG CCTGTGTGCT CGACATTGGT 11	
circopordfp	1101 GIGGTIGCAT TITGGAGCGC ATAGCCCAGG CETGIGTGCT CGACATTGGT 11	
		-
	1160 1170 1180 1190 1200	
circopormank	1151 STEGGTATTT AAATGGAGCC ACAGCTGGTT TCTTTTATTA TTTGGGTGGA 120	00
circopormeeh	1151 GTGGGTATTT AAATGGAGCC ACAGCTGGTT ICTTTATTA ITTGGGTGGA 120	
circopordfp	1151 STEGGSTATTT AAATGGAGCC ACAGCTGGTT ICTTTATTA ITTGGETGGA 120	00

FIGURE 3 (continuation 1)

·				- 1			
circopormank circopormeeh circopordfp	1201 1201 1201	ACCAATCAAT	1220 FGTTTGGTCC FGTTTGGTCC FGTTTGGTCT	1230 AGGTCAGGTT AGGTCAGGTT AGGTCF AGGT	1240 TGGGGGTGAA TGGGGGTGAA TGGGGGTGAA	4444446646	1250 1250 1250
Circopormank Circopormeeh Circopordfp	1251 1251 1251		1270 AGGGCTGCCT AGGGCTGCCT AGGGCTGCCT	1280 FATGGTGTGG FATGGTGTGG FATGGTGTGG	1290 TGGGAGAGT TGGGAGAGT TGGGAGAGT	0061 AGTTAATAT AGTTAATAT ATATAATTD	1300 1300 1300
circopormank circopormeeh circopordfp	1301 1301 1301	GGGGTCATAG	1320 GCCAAGTTGG GCCAAGTTGG GCCAAGTTGG	1330 FGGAGGGGT FGGAGGGGT TGGAGGGGGT	1340 FACAAAGTTG FACAAAGTTG FACAAAGTTG	1350 GCATCCAAGA GCATCCAAGA GCATCCAAGA	1350 1350 1350
circopormank circopormeeh circopordfp	1351 1351 1351		1370 GGACCCAACA GGACCCAACA GGACCCAACA		FAGAGGTGAT	1400 GGGGTCTCTG GGGGTCTCTG GGGGTCTCTG	1400 1400 1400
circopormank circopormeeh circopordfp	1401 1401 1401	GGGTAAAATT	1420 CATATTTAGC CATATTTAGC CATATTTAGC	1430 TITIGIAATA TITIGIAATA TITIGIAATA	CGGTAGTATT	1450 GGAAAGGTAG GGAAAGGTAG GGAAAGGTAG	1450 1450 1450
circopormank circopormeeh circopordfp	1451 1451 1451	GGGTAGGGG	1470 FTGGTGCCGC FTGGTGCCGC FTGGTGCCGC	1480 CTGAGGGGG CTGAGGGGGG CTGAGGGGGG	1490 GAGGAACTGG GAGGAACTGG GAGGAACTGG	1500 CCGATGTTGA CCGATGTTGA CCGATGTTGA	1500 1500 1500
circopormank circopormeeh circopordfp	1501 1501 1501	ATTTGAGGTA	1520 STTAACATIC STTAACATIC STTAACATIC		GCGAGTATCC	1550 ICCHTTATG ICCHTTATG ICCICHTATG	1550 1550 1550
circopormank circopormeeh circopordfp	1551 1551 1551	GTGAGTACAA	1570 THEITFAGA THEITFAGA THEITFAGA	1580 AAGGCGGZAA AAGGCGGAA AAGGCGGAA	1590 FTGAAGATAC FTGAAGATAC FTGAAGATAC	1600 	1600 1600 1600
circopormank circopormeeh circopordfp	1601 1601 1601	SCGCCATCTG	TAACGGTTTC TAACGGTTTC TAACGGTTTC	1630 FGAAGGCGGG FGAAGGCGGG FGAAGGCGGG	1640 TIGTGCCAAA GTGTGCCAAA GTGTACCAAA	1650 FATGGTCTTC FATGGTCTTC FATGGTCTTC	1650 1650 1650
circopormank circopormeeh circopordfp	1651	1660 FCCGGAGGAT FCCGGAGGAT FCCGGAGGAT	T	1680 FGGCTGCGGG FGGCTGCGGG FGGCTGCGGG		1700 ICTTCTGCGG ICTTCTGCGG ICTTCTGCGG	1700 1700 1700
circopormank circopormeeh circopordfp	1701 1701 1701	TEACGCCTCC	TTGGCCACGT TTGGCCACGT TTGGCCACGT		1740 AAGTGAAAGA AAGTGAAAGA AAGTGAAAGA		1750 1750 1750
circopormank circopormeeh circopordfp	1751 1751	1760 IGTAGTATI IGTAGTATI IGTAGTATI	1770	1780			1200 1800 1800

FIGURE 3 (continuation 2)

• •				1	•		•
circopormonk circopormeeh circopordfp[	1 1	10 MPSKKSGPQP MPSKKSGPQP MPSKKSGPQP	20 HKRWVFTLNN HKRWVFTLNN HKRWVFTLNN	30 PSEEEKNKIR PSEEEKNKIR PSEEEKNKIR	ELPISLEDYF ELPISLEDYF ELPISLEDYF	SO VCGEEGLEEG VCGEEGLEEG VCGEEGLEEG	\$0 50 50
circopormank circopormeeh circopordfp[	51 51 51	60 RTAHLOGFAN RTPHLOGFAN RTPHLOGFAN	70 FAKKQTFNKV FAKKQTFNKV FAKKQTFNKV	80 XWYFGARCHI XWYFGARCHI XWYFGARCHI	90 EKAKGTOQON EKAKGTOQON	100 KEYCSKEGHI KEYCSKEGHI KEYCSKEGHI	100 100 100
circopormank circopormeeh circopordfp[	101 101 101	110 LIECGAPRNQ LIECGAPRNQ LIECGAPRNQ	120 GKRSDLSTAV GKRSDLSTAV GKRSDLSTAV	130 STLLETGSLV STLLETGSLV STLLETGSLV	TVAEQFPVTY TVAEQFPVTY TVAEQFPVTY	150 VRNFRGLAEL VRNFRGLAEL VRNFRGLAEL	150 150 150
circopormank circopormeeh circopordfp[	151 151 151	160 KVSGKMQQR LKVSGKMQQR LKVSGKMQQR	170 DWKTAVHVIV DWKTAVHVIV	180 GPPGCGKSQW GPPGCGKSQW GPPGCGKSQW	190 ARNFAEPSOT ARNFAEPROT ARNFAEPROT	200 YWKPSRNKWW YWKPSRNKWW YWKPSRNKWW	200 200 200
circopormonk circopormeeh circopordfp[	201 201 201	210 DGYHGEEVVV DGYHGEEVVV DGYHGEEVVV	ZZO LDDFYGWLPW LDDFYGWLPW LDDFYGWLPW	230 DDLLRLCDRY DDLLRLCDRY DDLLRLCDRY	240 PLTVETKGGT PLTVETKGGT PLTVETKGGT	ZS0 VPFLARSILI VPFLARSILI VPFLARSILI	250 250 250
circopormank circopormeeh circopordfp[	251 251 251	260 TSNQAPQEWY TSNQAPQEWY TSNQAPQEWY	270 SSTAVPAVEA SSTAVPAVEA SSTAVPAVEA	280 YRRITTLOF YRRITTLOF YRRITTLOF	290 WKTAGEQSTE WKTAGEQSTE WKTAGEQSTE	300 VPEGRFEAVD VPEGRFEAVD VPEGRFEAVD	300 300 300
circopormank circopormeeh circopordfp[	301 301 301		320	330	340	350	350 350 350

	10 20 30 40 50	
circopormank	1 MTWPRRRYRR RRTRPRSHLG HILRRRPYLA HPAFRNRYRW RRKTGIFNSR	50
circopormeeh circopordfp[	1 MTWPRRRYRR RRTRPRSHLG MILRRRPYLA HPAFRNRYRW RRKTGIFNSR 1 MTWPRRRYRR RRTRPRSHLG MILRRRPYLY HPAFRNRYRW RRKTGIFNSR	50 50
ctrcoporatpt	1 William Walland in Suntain was a second training in the contract of the cont	30
•	60 70 80 90 100	
circopormank		100
circopormeeh		100
circopordfp[	51 ISREEVLTIR GGISOPSWNV HELRENIGGE LPPSGGTNPL PLPFQYYRIR	100
	110 120 130 140 150	
circopormank		150
circopormech		150
circopordfp[ ·	101 KAKYEFYPRO PITSNORGVG STVVILDANE VTPSTNLAYD PYINYSSRHT	150
	160 170 180 190 200	
circopormank	151 TROPFTYHSR YFTPKPELOO TESTEHPNNK RNOLWLHLNT HTNVEHTGLG	200
circopormeeh	151 TROPFTYHSR YFTPKPELDQ TIOWFHPNNK RNQLWLHLNT HTNVEHTGLG	200
circopordfp[	151 EROPETYHER VETPKPELOO TOWED NIK RNOLWLHINT HINVEHTGLG	200
•	210 220 230 240 250	
circopormank		250
circopormeeh		250
circopordfp[	201 YALQNATTAO HYVVRLTIYV DEREFILKOP INE.	250
	•	`
	770777	
	FIGURE 5	
circopormank	10 20 30 40 50 1 MISTPRIST REPYGYARIS SHIGPLART IGRAHYDVYS SERITLEHER	50
circopormeeh	1 MISIPPLIST RLPVGVPRLS KITGPLALPT IGRAHYDVYS ELPITLLHLP	50
circopordfp[	1 ATSTPPLTST REPVGVPRES KTTGPLALPT TGRAHYOVYS CEPTTLEHEP	50
••		
-:	60 70 80 90 100 51 AHFOKESOPA FISHIRYREL LGYSHORPRU OKGTHESROV AALPLVPRSS	100
circopormank circopormeeh	51 AHFOKESOPA EISHIRYREL LGYSHORPRL OKGTHSSROV AALPLVPRSS 51 AHFOKESOPA EISHIRYREL LGYSHORPRL OKGTHSSROV AALPLVPRSS	100
circopordfp[	SI AHFOKESOPA SISHIRYRK LOYSHORPRI DKGTHSSROV AALPLVPRSS	100
	110 120 130 140 150	
circopormank	101 TLDKYVAFFT AVFFILLVGS FRELOVAAGT KIPLHLVKSL LLSKISKPLE	150 150
circopormeeh		150
circopordfp[	101 MONYVARE AVERTURES ERRESVANGI KIRLINVKSE ELSKIKERE	130
	160 170 180 190 200	
circopormank	151 VSSTLEGTE LSANKIIKKG DWKLPYFVFL LLGRIIKGEH PPLMGLRAAF	200
circopormech	151 VRSSTLFOTF LSANKIIKKG DWKLPYFVFL LLGRIIKGEH PPLMGLRAAF	200
circopordfp[	151 VRSSTLEGTE LATHKIIKKG DWKLPYFVFL LLGRIIKGEH PPLMGLRAAF	200
,	210 220 230 240 250	
circopormank	201 AVIET	250
circopormeeh	201 AWHF-H	250
circopordfp[	201 AWHEH	250

FIGURE 6

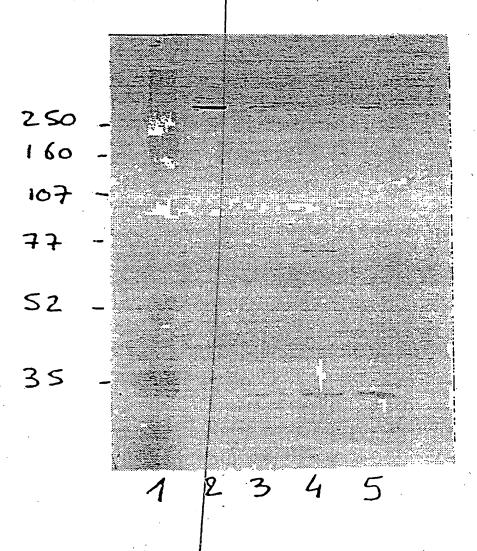


FIGURE 7
REPLACEMENT SHEET (RULE 26)

Leu Ala Ser Arg Cys Arg Cys Cys Arg Pro Leu Val Glu Ala Ala Val His Gly Trp Arg Val Glu Ala Ala Ala Gly Arg Cys Cys Arg Leu Leu Met Gly Gly Ala Cys Lys Pro Leu Pro Leu Val Glu Ala Ala Gly ... Cys Cys Ala TOG TOG COT GAA GCC GTC GCC GTC GTC GAG CCC TCG TCG AGT CCT CCT TCT ACG 9 18 27 36 45 54 ACC AGC GCA CTT CGG CAG CGG CAG CAC CTC GGC AGC ACC TCA GCA GCA ACA TGC --- --- --- --- --- --- --- --- ------ --- --- --- ---Thr Ser Ala Leu Arg Gln Arg Gln His Leu Gly Ser Thr Ser Ala Ala Thr Cys Pro Ala His Phe Gly Ser Gly Ser Thr Ser Ala Ala Pro Gln Gln His Ala Gln Arg Thr Ser Ala Ala Ala Ala Pro Arg Gln His Leu Ser Ser Asn Met Pro

Ala Leu Leu Ile Ser Ser Ala Ser Gly Leu Gly Met Phe Pro Pro His Glu Ser Leu Leu Phe Phe Pro Leu Leu Pro Gly Trp Gly Trp Leu Leu His Thr Asn Val Trp Cys Ser Ser His Phe Phe Arg Val Gly Val Gly Tyr Phe Thr Pro Thr \*\*\*

GGT CGT TCT TCT TAC CTT CTT CCC CTG CCC TTG CCC TAT TTT CCA CCC ACA AGT 63 72 81 90 99 108

CCA GCA AGA AGA ATG GAA GAA GCG GAC CCC AAC CCC ATA AAA CGT CGG TGT TCA

Pro Ala Arg Arg Met Glu Glu Ala Asp Pro Asn Pro Ile Lys Gly Gly Cys Ser Gln Gln Glu Glu Trp Lys Lys Arg Thr Pro Thr Pro \*\*\* Lys Val Gly Val His Ser Lys Lys Asn Gly Arg Ser Gly Pro Gln Pro His Lys Arg Trp Val Phe Thr

Gln Ile Ile Arg Gly Phe Val Leu Ala Leu Phe Tyr Pro Ile Lys Trp Tyr Gly Arg Phe Leu Gly Glu Ser Ser Ser Arg Leu Phe Ile Arg Ser Arg Gly Ile Asp Glu Ser Tyr Asp Lys Arg Leu Arg Ala Cys Ser Phe Val Pro Asp Glu Leu Ile

GAG ACT TAT TAG GAA GCC TTC TGC TGG CGT TCT TTT ATG CCC TAG AAG GTT ATA 117 126 135 144 153 162

CTC TGA ATA ATC CTT CCG AAG ACG ACC GCA ACA AAA TAC GCG ATC TTC CAA TAT

Leu \*\*\* Ile Ile Leu Pro Lys Thr Ser Ala Arg Lys Tyr Gly Ile Phe Gln Tyr Ser Glu \*\*\* Ser Phe Arg Arg Arg Ala Gln Glu Asn Thr Gly Ser Ser Asn Ile Leu Asn Asn Pro Ser Glu Asp Glu Arg Lys Ile Arg Asp Leu Pro Ile Ser

Val Glu Leu Pro Glu Ser Ile Lys His Leu Leu Leu Ser Lys Ile Phe His Leu

"Arg Trp Pro Asn Ala Leu Lys Thr Phe Phe Cys Val Lys Leu Leu Thr Phe
Glu Gly Gly Pro Thr Arg "Asn Gln Ser Ser Ala Ser Lys "Tyr Leu Ser

GAG TGG AGG TCC CCA AGC GAT TAA AAC ACT TCT TCG TCT GAA AAT TAT TTC ACT

225

234

243

252

261

270

CTC ACC TCC AGG GGT TCG CTA ATT TTG TGA AGA AGC AGA CTT TTA ATA AAG TGA

Leu Thr Ser Arg Gly Ser Leu Ile Leu "Arg Ser Arg Leu Leu Ile Lys "Ser Pro Pro Gly Val Arg "Phe Cys Glu Glu Ala Asp Phe "Ser Glu

His Leu Gln Gly Phe Ala Asn Phe Val Lys Lys Gln Thr Phe Asn Lys Val Lys

Pro Ile Gln Thr Gly Ala Ala Val Asp I'eu Phe Arg Phe Ser Cys Ile Leu Leu His Tyr Lys Pro Ala Arg Gln Trp Met Ser Phe Ala Phe Pro Val Ser \*\*\* Cys Thr Thr Asn Pro His Gly Ser Gly Cys Arg Ser Leu Ser Leu Phe Leu Asp Ala --- --- --- --- --- --- --- ------ --- --- --- ---TCA CCA TAA ACC CAC GGG CGA CGG TGT AGC TCT TTC GCT TTC CTT GTC TAG TCG 279 288 297 306 315 324 AGT GGT ATT TGG GTG CCC GCT GCC ACA TCG AGA AAG CGA AAG GAA CAG ATC AGC Ser Gly Ile Trp Val Pro Ala Ala Thr Ser Arg Lys Arg Lys Glu Gln Ile Ser Val Val Phe Gly Cys Pro Leu Pro His Arg Glu Ser Glu Arg Asn Arg Ser Ala Trp Tyr Leu Gly Ala Arg Cys His Ile Glu Lys Ala Lys Gly Thr Asp Gln Gln

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Ile Phe Phe Val Ala Thr Phe Phe Ala Val \*\*\* Gln His Leu Thr Ser Ser Arg Phe Leu Ser Tyr Gln Leu Leu Ser Pro Leu Lys Ser Ile Ser His Pro Ala Gly Ser Tyr Leu Ile Ser Cys Tyr Leu Leu Cys Ser Val Ser Pro Thr His Leu Glu --- --- --- --- --- ---TCT TAT TTC TTA TGA CGT CAT TTC TTC CGT TGA ATG ACT ACC TCA CAC CTC GAG 333 342 351 360 369 378 AGA ATA AAG AAT ACT GCA GTA AAG AAG GCA ACT TAC TGA TGG AGT GTG GAG CTC --- --- --- --- --- --- ---Arg Ile Lys Asn Thr Ala Val Lys Lys Ala Thr Tyr \*\*\* Trp Ser Val Glu Leu Glu \*\*\* Arg Ile Leu Gln \*\*\* Arg Arg Gln Leu Thr Asp Gly Val Trp Ser Ser Asn Lys Glu Tyr Cys Ser Lys Glu Gly Asn Leu Leu Met Glu Cys Gly Ala Pro

Ser Arg Leu Ser Leu Pro Thr Val Gln Arg Ser Ser His Thr Gly Gln Gln Leu Leu Asp \*\*\* Pro Cys Arg Leu Ser Arg Asp Val Ala Thr Leu Val Lys Asn Ser \*\*\* Ile Glu Pro Val Val Ser His Cly Thr \*\*\* Gln Gln Ser Tyr Arg Thr Pro --- --- --- --- --- --- --- --- --- --- --- --- ---GAT CTA GAG TCC CTG TTG CCT CAC TCG ACA GAT GAC GAC ACT CAT CGA ACA ACC 387 / 396 405 414 423 432 CTA GAT CTC AGG GAC AAC GGA GTG ACC TGT CTA CTG CTG TGA GTA CCT TGT TGG ... ... ... ... ... ... ... ... ... Leu Asp Leu Arg Asp Asn Gly Val Thr Cys Leu Leu Leu ... Val Pro Cys Trp \*\*\* Ile Ser Gly Thr Thr Glu \*\*\* Pro Val Tyr Cys Cys Glu Tyr Leu Val Gly Arg Ser Gln Gly Gln Arg Ser Asp Leu Ser Thr Ala Val Ser Thr Leu Leu Glu

Ala Pro Thr Gln His Gly Asn Cys Leu Leu Val Arg Tyr Arg Lys Asp Ser Ile
Leu Pro Leu Arg Thr Val Thr Ala Ser Cys Cys Gly Thr Val Asn Thr Leu Phe
Ser Arg Ser Asp Pro Ser Arg Gln Leu Ala Ala Gly Gln Leu Thr Gln ... Phe
TCT CCC CCT CAG ACC ACT CCC AAC GTC TCG TCG TCG GAC ATT GCA AAC ACT CTT
441 450 459 468 477 486
AGA CCC GGA GTC TGG TGA CCG TTG CAG ACC ACC CTG TAA CGT TTG TCA GAA
Arg Ala Gly Val Trp ... Pro Leu Gln Ser Ser Thr Leu ... Arg Leu Ser Glu
Glu Arg Glu Ser Gly Asp Arg Cys Arg Ala Ala Pro Cys Asn Val Cys Gln Lys
Ser Gly Ser Leu Val Thr Val Ala Glu Gln His Pro Val Thr Phe Val Arg Asn

Glu Ala Pro Gln Ser Phe Lys Gln Phe His Ala Pro Phe His Leu Leu Thr Ile Lys Arg Pro Ser Ala Ser Ser Lys Phe Thr Leu Pro Phe Ile Cys Phe Arg Ser Asn Gly Arg Ala Pro Gln Val Lys Ser Leu Ser Arg Ser Phe Ala Ser Ala His TAA AGG CGC CCG ACC GAC TTG AAA ACT TTC ACT CGC CCT TTT ACG TCT TCG CAC 495 504 513 522 531 540 ATT TCC GCG GGC TGG CTG AAC TTT TGA AAG TGA GCG GGA AAA TGC AGA AGC GTG --- --- --- --- --- --- --- ---Ile Ser Ala Gly Trp Leu Asn Phe '' Lys " Ala Gly Lys Cys Arg Ser Val Phe Pro Arg Ala Gly \*\*\* Thr Phe Glu Ser Glu Arg Glu Asn Ala Glu Ala \*\*\* Phe Arg Gly Leu Ala Glu Leu Leu Lys Val Ser Gly Lys Met Gln Lys Arg Asp

FIGURE 8

(continuation 1)

Pro Leu Ser Ile Tyr Val Asp Asn His Pro Trp Arg Pro Thr Thr Phe Ala Phe Gln Phe Val Leu Thr Cys Thr Met Thr Pro Gly Gly Pro His Pro Leu Leu Leu Asn Ser Ser \*\*\* His Val Arg \*\*\* Gln Pro Ala Val Gln Thr His Tyr Phe Cys

TAA CCT TCT GAT TAC ATG TCC AGT AAC ACC CCG GTG GAC CCA CAC CAT TTT CGT 549 558 567 576 585 594

ATT GGA AGA CTA ATG TAC ACG TCA TTG TCG CCC CAC CTG GGT GTA AAA GCA

Ile Gly Arg Leu Met Tyr Thr Ser Leu Trp Gly His Leu Gly Val Val Lys Ala Leu Glu Asp \*\*\* Cys Thr Arg His Cys Gly Ala Thr Trp Val Trp \*\*\* Lys Gln Trp Lys Thr Asn Val His Val Ile Val Gly Pro Pro Gly Cys Gly Lys Ser Lys

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Pro Ser Ser Ile Lys Cys Val Arg Phe Cly Cys Val Pro Phe Trp Arg Ser Val His Ala Ala Leu Lys Ala Ser Gly Ser Vall Val Tyr Gln Phe Gly Gly Leu Phe Ile Pro Gln \*\*\* Asn Gln Leu Gly Pro Phe Trp Met Ser Ser Val Val \*\*\* Phe --- --- --- --- --- ------ ------- --- --- --- --- ---TTA CCC GAC GAT TAA AAC GTC TGG GCC TTT GGT GTA TGA CCT TTG GTG GAT CTT 612 621 630 639 AAT GGG CTG CTA ATT TTG CAG ACC CGG AAA CCA CAT ACT GGA AAC CAC CTA GAA 648 --- --- --- --- ---Asn Gly Leu Leu Ile Leu Gln Thr Arg Lys Pro His Thr Gly Asn His Leu Glu Met Gly Cys \*\*\* Phe Cys Arg Pro Gly Asn His Ile Leu Glu Thr Thr \*\*\* Lys Trp Ala Ala Asn Phe Ala Asp Pro Glu Thr Thr Tyr Trp Lys Pro Pro Arg Asn

Leu Pro Pro Ile Thr Val Met Thr Phe Phe His Asn Asn Ile Val Lys Ile Leu His His Ser Pro \*\*\* Trp Pro Ser Ser Thr Thr Thr Ile Ser Ser Lys \*\*\* Cys Thr Thr Pro His Asn Gly His His Leu Pro Gln ... Gln His Ser Lys --- --- --- --- --- --- --- --- ---- --- --- --- --- --- ---TGT TCA CCA CCC TAC CAA TOG TAC CAC TTC TTC ACC AAC AAT AAC TAC TGA AAA 657 666 675 684 693 702 ACA AGT GGT GGG ATG GTT ACC ATG GTG AAG AAG TGG TTG TTA TTG ATG ACT TTT Thr Ser Gly Gly Met Val Thr Met Val Lys Lys Trp Leu Leu Leu Met Thr Phe Gin Val Val Gly Trp Leu Pro Trp \*\*\* Arg Ser Gly Cys Tyr \*\*\* Leu Leu Lys Trp Trp Asp Gly Tyr His Gly Glu Glu Val Val Val Ile Asp Asp Phe Tyr

Ala Pro Gln Gly Pro Ile Ile \*\*\* Gln Ser Gln Thr Ile Ser Ile Trp Gln Ser Pro Gln Ser Gly Gln Ser Ser Arg Ser Leu Ser His Ser Arg Tyr Gly Asn Val His Ser Ala Ala Arg Pro His Asp Val Ser Val Thr His Asp Ile Asp Met Ser TAC CGA CCG ACG GGA CCC TAC TAG ATC ACT CTG ACA CAC TAG CTA TAG GTA ACT TIL 720 729 738 747 756 ATG GCT GGC TGC CCT GGG ATG ATC TAC TGA GAC TGT GTG ATC GAT ATC CAT TGA Met Ala Gly Cys Pro Gly Met Ile Tyr \*\*\* Asp Cys Val Ile Asp Ile His \*\*\* Trp Leu Ala Ala Leu Gly \*\*\* Ser Thr Glu Thr Val \*\*\* Ser Ile Ser Ile Asp Gly Trp Leu Pro Trp Asp Asp Leu Leu Arg Leu Cys Asp Arg Tyr Pro Leu Thr

Tyr Leu Ser Phe Thr Ser Ser Tyr Arg Lys Gln Gly Ala Thr Asn Gln Asn Gly Thr Ser Val Leu Pro Pro Val Thr Cly Lys Lys Ala Arg Leu Ile Arg Ile Val Gln Leu Ser \*\*\* Leu His Phe Gln Val Lys Lys Pro Gly Cys Tyr Glu Ser \*\*\* --- --- --- --- --- ---GAC ATC TCT GAT TTC CAC CTT GAC ATC GAA AAA ACC GGC CGT CAT AAG ACT AAT 765 774 783 792 801 810 CTG TAG AGA CTA AAG GTG GAA CTG TAC CTT TTT TOG CCC GCA GTA TTC TGA TTA !- --- --- --- --- ------ --- --- --- --- ---Leu \*\*\* Arg Leu Lys Val Glu Leu Tyr Leu Phe Trp Pro Ala Val Phe \*\*\* Leu Cys Arg Asp \*\*\* Arg Trp Asn Cys Thr Phe Phe Gly Pro Gln Tyr Ser Asp Tyr Val Glu Thr Lys Gly Gly Thr Val Pro Phe Leu Ala Arg Ser Ile Leu Ile Thr

FIGURE 8 (continuation 2)

Ala Ile Leu Gly Arg Gln Phe Pro Val Gly \*\*\* Ser Ser Asp Trp Ser Tyr Phe Leu Leu \*\*\* Val Gly Asn Ser His Tyr Glu Glu Val Ala Thr Gly Ala Thr Ser Trp Cys Asp Ser Gly Thr Pro Ile Thr Ser Arg Leu Gln Gln Gly Leu Gln Leu GT CGT TAG TCT CGG CCA ACC TTA CCA TGA CGA GTT GAC GAC ACG GTC GAC ATC 819 828 837 846 855 864 CCA GCA ATC AGA CCC CGT TGG AAT GGT ACT CCT CAA CTG CTG TCC CAG CTG TAG Pro Ala Ile Arg Pro Arg Trp Asn Gly Thr Pro Gln Leu Leu Ser Gln Leu \*\*\* Gln Gln Ser Asp Pro Val Gly Met Val Leu Leu Asn Cys Cys Pro Ser Cys Arg Ser Asn Gln Thr Pro Leu Glu Trp Tyr Ser Ser Thr Ala Val Pro Ala Val Glu

Ser Lys Ile Pro Pro Asn Ser Gly Gln Tyr Lys Pro Leu Ile Ser Cys Phe Leu Ala Arg \*\*\* Arg Leu Ile Val Glu Lys Thr Asn Gln Phe Phe Ala Val Ser Cys Leu Glu Lys Asp Ser Ser \*\*\* Lys Arg Pro Ile Lys Ser Ser His \*\*\* Leu Val --- --- --- --- --- ---TTC GAG AAA TAG CCT CCT AAT GAA GGA ACC ATA AAA CCT TCT TAC GAT GTC TTG 873 882 891 900 909 918 AAG CTC TTT ATC GGA GGA TTA CTT CCT ITOG TAT TIT GGA AGA ATG CTA CAG AAC \_\_\_ --- --- --- --- --- ---Lys Leu Phe Ile Gly Gly Leu Leu Pro Trp Tyr Phe Gly Arg Met Leu Gln Asn Ser Ser Leu Ser Glu Asp Tyr Phe Leu Gly Ile Leu Glu Glu Cys Tyr Arg Thr Ala Leu Tyr Arg Arg Ile Thr Ser Leu Val Phe Trp Lys Asn Ala Thr Glu Gln

Gly Arg Leu Phe Pro Ala Leu Glu Asp Gly Lys Gly Gly Trp Ala Arg Phe Lys Asp Val Ser Ser Pro Pro Trp Asn Thr Val Arg Glu Gly Gly His Gly Ser Asn Ile Trp Pro Pro Leu Pro Gly Thr Arg \*\*\* Gly Lys Gly Gly Het Gly Gln Ile

TTA GGT CCC TCC TTC CCC CCG TCA ACC AGT CCC AAA CCG CCG GTA CCG GAC TTA 927 936 945 954 963 972

AAT CCA CCG ACG AAG CCC ACT TCC TCA CCC TTT CCC CCC CAT CCC CTG AAT

Asn Pro Arg Arg Lys Gly Ala Ser Ser Ser Pro Phe Pro Pro His Ala Leu Asn Ile His Gly Gly Arg Gly Pro Val Arg His Pro Phe Pro Pro Met Pro \*\*\* Ile Ser Thr Glu Glu Gly Gly Gln Phe Val Thr Leu Ser Pro Pro Cys Pro Glu Phe

Trp Ile Phe Tyr Ile Val Ser Asp Lys Lys Asp Ser Arg Leu Pro Lys ...

Gly Tyr Ser Ile Phe ... Gln Thr Lys Lys Ile Val Glu Tyr His Asn Lys Asn Glu Met His Phe Leu Asn Ser Leu Arg Lys ... Lys Thr Ile Thr Lys Ile

AAG GTA TAC TIT ATT TAA TGA CTC AGA AAA AAT AGT GAA GCA TTA CCA AAA ATA

981 990 1008 1017 1026

TTC CAT ATG AAA TAA ATT ACT GAG TCT TIT TTA TCA CTT CGT AAT GGT TIT TAT

Phe His Met Lys ... Ile Thr Glu Ser Phe Leu Ser Leu Arg Asn Gly Phe Tyr

Ser Ile ... Asn Lys Leu Leu Ser Leu Phe Tyr His Phe Val Met Val Phe Ile

Pro Tyr Glu Ile Asn Tyr ... Val Phe Phe Ile Thr Ser ... Trp Phe Leu Leu

Glu Asn Leu Thr Leu His Pro Thr Lys Leu Ile Leu Asn Glu Ser Asn Tyr Met Asn Met Leu Pro \*\*\* Thr Pro Pro Arg \*\*\* Phe \*\*\* Ile Arg Gln Ile Thr Cys Ile \*\*\* "\*\* Pro Asn Leu Pro Pro Asp Lys Phe Asn Phe Glu Arg Phe Gln Val ATA AGT AAT TCC CAA TTC ACC CCC CAG AAA TTT TAA TTT AAG AGA CTT AAC ATG 1035 1044 1053 1062 1071 1080 TAT TCA TTA AGG CTT AAG TGG GGG GTC TTT AAA ATT AAA TTC TCT GAA TTG TAC Tyr Ser Leu Arg Val Lys Trp Gly Val Phe Lys Ile Lys Phe Ser Glu Leu Tyr Ile His \*\*\* Gly Leu Ser Gly Gly Ser Leu Lys Leu Asn Ser Leu Asn Cys Thr Phe Ile Lys Gly \*\*\* Val Gly Gly Leu \*\*\* Asn \*\*\* Ile Leu \*\*\* Ile Val His

Cys Pro \*\*\* Val Ser Ile Thr Asn Arg Thr Thr Tyr Val Thr Lys Ser Arg Leu Val His Asn Cys Pro Tyr Gln Ile Gly Pro Arg Ile Tyr Gln Lys Arg Val Cys Tyr Met Thr Val Arg Ile Asn Tyr Glu Gln Asp Tyr Ile Ser Asn Glu Phe Ala TAT GTA CCA ATG TCC CTA TAA CAT AAG GAC CAG CAT ATA TGA CAA AAG CTT CCC 1089 1098 1107 1116 1125 1134 ATA CAT GGT TAC ACG GAT ATT GTA TTC CTG GTC GTA TAT ACT GTT TTC GAA CCC Ile His Gly Tyr Thr Asp Ile Val Phe Leu Val Val Tyr Thr Val Phe Glu Arg Tyr Met Val Thr Arg Ile Leu Tyr Ser Trp Ser Tyr Ile Leu Phe Ser Asn Ala Thr Trp Leu His Gly Tyr Cys Ile Pro Gly Arg Ile Tyr Cys Phe Arg Thr Gln

Ala Ser Ala \*\*\* Thr Thr \*\*\* Met Glu Leu Leu Lys Tyr Asp \*\*\* Gly Cys Ser His Arg Pro Arg Arg Pro Arg Cys Lys Trp Cys Asn Thr Thr Glu Ala Val Ala Thr Gly Leu Gly Val His Asp Val Asn Gly Ala Thr Gln Leu Arg Leu Trp Leu TCA CCC CTC CCC ATG CAC CAG ATG TAA ACG TCC TCA AAC ATC AGA GTC CCT CTC 1143 1152 1161 1170 1179 1188 ACT GCC GAG GCC TAC GTG GTC TAC ATT TCC AGC ACT TTG TAG TCT CAG CCA CAG Ser Ala Glu Ala Tyr Val Val Tyr Ile Ser Ser Ser Leu \*\*\* Ser Gln Pro Gln Val Pro Arg Pro Thr Trp Ser Thr Phe Pro Ala Val Cys Ser Leu Ser His Ser Cys Arg Gly Leu Arg Gly Leu His Phe Gln Gln Phe Val Val Ser Ala Thr Ala

Thr Glu Lys Thr Thr Gln Asn Ser Thr Ile Leu Leu Ser Ile \*\* Ser Leu Asn Pro Lys Lys Gln Gln Lys Thr Pro Leu Leu \* Tyr His Phe Arg Pro Cys Thr Gln Asn Arg Lys Asn Asn Pro Gln Phe Tyr Asp Ile Thr Phe Asp Leu Val Pro GAC CAA AGA AAA CAA ACC AAC CTT CAT TAG TTA TCA CTT TAG ATC CTG TCC 1197 1206 1215 1224 1233 1242 CTG GTT TCT TTT GTT GTT TCG TTG GAA GTA ATC AAT AGT GAA ATC TAG GAC AGG Leu Val Ser Phe Val Val Trp Leu Glu Val Ile Asn Ser Glu Ile \*\* Asp Arg Trp Phe Leu Leu Leu Phe Gly Trp Lys \*\* Ser Ile Val Lys Ser Arg Thr Gly Gly Phe Phe Cys Cys Leu Val Gly Ser Asn Gln \*\* Asn Leu Gly Gln Val

Pro Pro Leu Thr Gly Pro Thr Thr Pro Ser Pro Ser Pro \*\*\* Pro Ile Ala Pro Gln Pro Tyr Leu Val Pro Leu Pro Leu Leu Leu Leu Ala Pro Asn His Tyr Pro Pro Lys Pro Thr Phe Tyr Arg Ser His Tyr Ser Phe Pro Gln Thr Ile Thr His Arg

AAA CCC CCA TTT CAT GGC CCT CAC CAT CCT CTT CCC GAC CCA ATA CCA TAC CGC 1251 1260 1269 1278 1287 1296

TTT GGG GGT AAA GTA CCG GGA GTG GTA GGA GGG CTG GGT TAT GGT ATG GGG

Phe Gly Gly Lys Val Pro Gly Val Val Gly Glu Gly Leu Gly Tyr Gly Met Ala Leu Gly Val Lys Tyr Arg Glu Trp \*\*\* Glu Lys Gly Trp Val Met Val Trp Arg Trp Gly \*\*\* Ser Thr Gly Ser Gly Arg Arg Arg Ala Gly Leu Trp Tyr Gly Gly

Pro Thr Thr \*\*\* Met Pro Thr Met Pro Ser Pro Gln Pro Arg Gln \*\*\* Leu Thr Leu Leu Leu Lys Cys Leu Pro \*\*\* Leu His Pro Ser His Gly Lys Asn Cys Leu Ser Ser Tyr Asn Val Tyr Pro Asp Tyr Thr Leu Ala Thr Ala Lys Thr Val Phe CCT CCT CAT CAA ATG TAT CCC CAG TAT CCA CTC CCG ACA CCG GAA ACA ATG TTT 1305 1314 1323 1332 1341 1350 GGA GGA GTA GTT TAC ATA GGG GTC ATA GGT GAG GGC TGT GGC CTT TGT TAC AAA Gly Gly Val Val Tyr Ile Gly Val Ile Gly Glu Gly Cys Gly Leu Cys Tyr Lys Glu Glu \*\*\* Phe Thr \*\*\* Gly Ser \*\* Val Arg Ala Val Ala Phe Val Thr Lys Arg Ser Ser Leu His Arg Gly His Arg \*\*\* Gly Leu Trp Pro Leu Leu Gln Ser

FIGURE 8 (continuation 4)

Ile Met \*\*\* Phe Leu Leu Val Pro Ala Trp Glu Gly Thr Val Arg Pro Ser Arg
\*\*\* Arg Phe Tyr Cys Cys Gln Leu Gly Ser Gly Gln \*\*\* Gly Pro His Asp
Asn Asp Asp Leu Ile Val Ala Ser Ser Gly Val Gly Arg Asp Gly Gln Thr Ile

CAA TAG TAG ATT TTA TTG TCG TGA CCT CCG GTG ACG CGA CAG TCG GAC CCA CTA

1359 1368 1377 1386 1395 1404

GTT ATC ATC TAA AAT AAC ACC ACT GGA CCC CAC TCC CCT GTC ACC CTG GGT GAT

Val Ile Ile \*\*\* Asn Asn Ser Thr Gly Ala His Ser Pro Val Thr Leu Gly Asp
Leu Ser Ser Lys Ile Thr Ala Leu Glu Pro Thr Pro Leu Ser Pro Trp Val Ile
Tyr His Leu Lys \*\*\* Gln His Trp Ser Pro Leu Pro Cys His Pro Gly \*\*\* Ser

Pro Ala Pro Gly Ser Asn Leu Arg Leu Arg Glu \*\*\* Glu Thr Thr Asn Leu Pro Pro Leu Leu Ala Leu Ile \*\*\* Gly \*\*\* Gly Lys Lys Asn Gln Leu Ile \*\*\* Leu Pro Ser Cys Pro Trp Phe Glu Val Lys Val Lys Arg Ile Arg Tyr Tyr Glu Phe OCC CCT CGT CCC GGT CTT AAG TTG GAA TTG GAA AGA ATA AGA CAT CAT AAG TTT 1413 1422 1431 1440 1449 1458 COG OGA GCA GGG CCA GAA TIC AAC CIT AAC CIT TCT TAT TCT GTA GTA TIC AAA --- --- --- --- --- --- --- ------ --- --- --- --- ---Arg Gly Ala Gly Pro Glu Phe Asn Leu Asn Leu Ser Tyr Ser Val Val Phe Lys Gly Glu Gln Gly Gln Asn Ser Thr Leu Thr Phe Leu Ile Leu ... Tyr Ser Lys Gly Ser Arg Ala Arg Ile Gln Pro \*\*\* Pro Phe Leu Phe Cys Ser Ile Gln Arg

Cys Leu Ala Pro Thr Gln Gly Gly Glu Gln Pro Phe Phe Thr Met Leu Ile Ser Ala Cys Leu Pro Pro Lys Val Gly Arg Arg Pro Ser Ser Leu \*\*\* Tyr Gln Pro Val Ser Arg Pro Asn Ser Gly Gly Gly Pro Pro Leu Phe Asp Asn Ile Asn CCC GTG TCT CCC CCC CAA ACT GCG GCG ACG ACC CCC TTC TTT CAG TAA TTA TAA 1467 1476 1485 1494 1503 1512 GCG CAC AGA GCG GCG GTT TGA CCC CCC TCC TCC GCG AAG AAA GTC ATT AAT ATT Gly His Arg Ala Gly Val \*\*\* Pro Pro Ser Trp Gly Lys Lys Val Ile Asn Ile Gly Thr Glu Arg Gly Phe Asp Pro Pro Pro Gly Gly Arg Lys Ser Leu Ile Leu Ala Gln Ser Gly Gly Leu Thr Pro Leu Leu Gly Glu Glu Ser His \*\*\* Tyr \*\*\*

Asp \*\*\* Thr Trp Arg Gly Pro Pro Arg Glu Ser Gln Pro Glu Ser Ser Leu Ile Glu Asp His Gly Gly Gly Leu Leu Ala Asn Gln Ser His Asn Ala Gln Cys Phe Arg Met Met Asp Val Ala Trp Ser Pro Thr Arg Val Thr Thr Arg Lys Val

CTT AGA GTA GTA CAG GTG GCG GGT CCT CCC GCA AGA CTG ACA CCA ACC GAA CTG

1521 1530 1539 1548 1557 1566

GAA TCT CAT CAT GTC CAC CGC CCA GGA GGG CGT TCT GAC TGT GGT TCG CTT GAC

Glu Ser His His Val His Arg Pro Gly Gly Arg Ser Asp Cys Gly Ser Leu Asp

Asn Leu Ile Met Ser Thr Ala Gln Glu Gly Val Leu Thr Val Val Arg Leu Thr

Ile Ser Ser Cys Pro Pro Pro Arg Arg Ala Phe \*\*\* Leu Trp Phe Ala \*\*\* Gln

Ile Asp Ser Pro Ala Pro Ser Ala Pro Thr Ser Ser Ala Met Lys Gly Glu Gly
Tyr Ile Arg Leu His Pro Leu Pro Pro His Gln Leu His Trp Lys Glu Lys Glu
Thr Tyr Gly Phe Thr Arg Ser Leu Arg Thr Asn Phe Ile Gly Asn Lys Arg Arg
TCA TAT AGG CTT CCA CCC CCT CTC CCC CCA CAA CTT CTA CCC TAA AAA GGA AGA
1575
1584
1593
1602
1611
1620
AGT ATA TCC GAA GGT GCG GGA GAG GCG GGT GTT GAA GAT GCC ATT TTT CCT TCT
Ser Ile Ser Glu Gly Ala Gly Glu Ala Gly Val Glu Asp Ala Ile Phe Pro Ser
Val Tyr Pro Lys Val Arg Glu Arg Arg Val Leu Lys Met Pro Phe Phe Leu Leu
Tyr Ile Arg Arg Cys Gly Arg Gly Gly Cys \*\*\* Arg Cys His Phe Ser Phe Ser

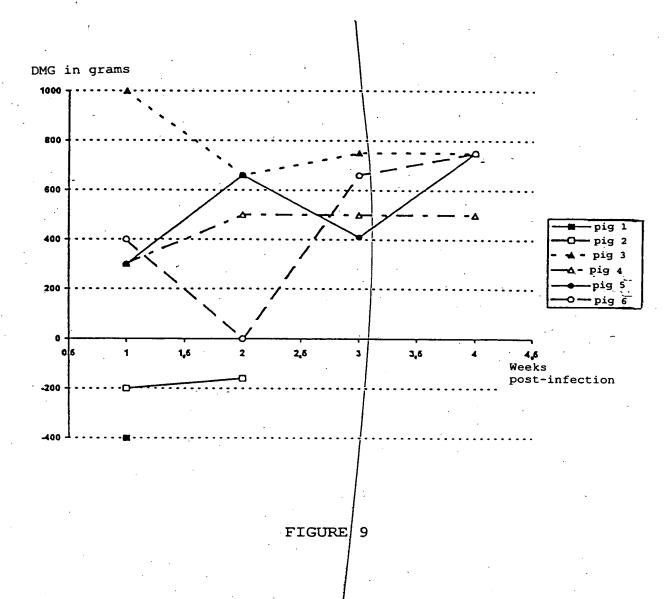
Asp Tyr Arg Phe Val Phe Ser Thr Arg Gln Leu Tyr
Thr Met Asp Ser Phe Ser Leu Leu Ala Ser Tyr Thr Asn

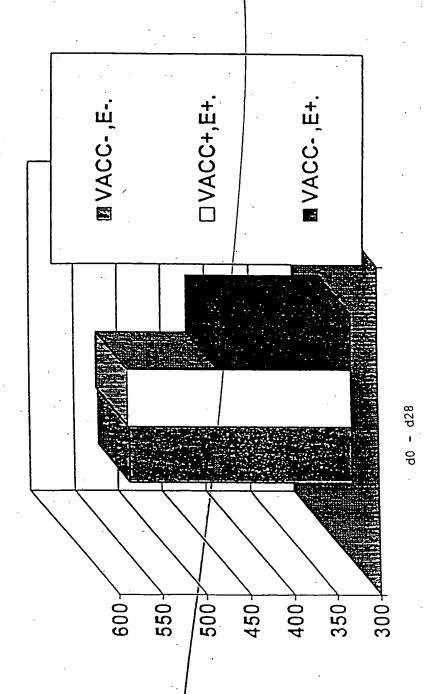
GCA GTA TAG ACT TTT GCT TTC TTC ACG CGA CAT TCA TAA 5'

1737 1746 1755 1764

CGT CAT ATC TGA AAA CGA AAG AAG TGC GCT GTA AGT ATT 3'

Arg His Ile \*\*\* Lys Arg Lys Lys Cys Ala Val Ser Ile
Val Ile Ser Glu Asn Glu Arg Ser Ala Leu \*\*\* Val
Ser Tyr Leu Lys Thr Lys Glu Val Arg Cys Lys Tyr





dmg: d0 - d28



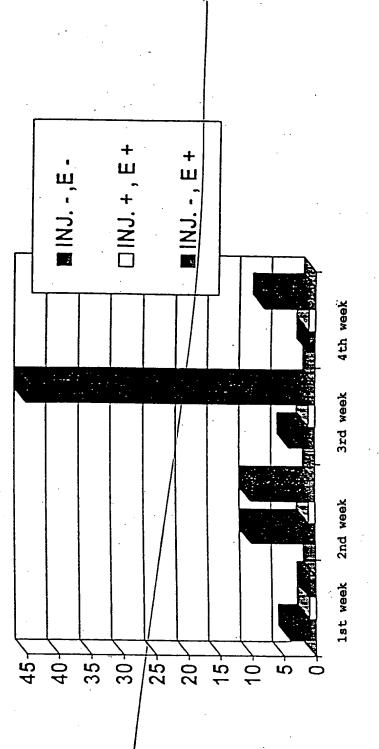
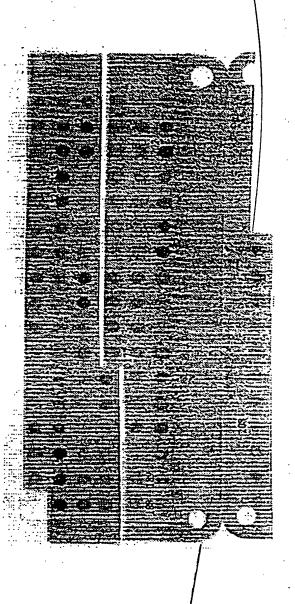


FIGURE 11



Type A

spot No. 160 to 215

. Type B spot No. 104 to 159

MIYPRRRYRR RRHRPRSHLG QILRRRPWLV HP. RHRYRW RRKNGIFNTR LSRTFGYTVK RTTVRTPSWA RGGHSQPSWN MTWPRRRYRR RRTRPRSHLG NILRRRPYLV HPAFRNRYRW RRKTGIFNSR LSREFVLTI. pcvA pcvB

peptides 188 to 189

100 101

RKAKYEFYPR DPITSNORGV GSTVVILDAN FVTPSTNLAY **FVTKATALTY** GSSAVILDDN RKVKVEFWPC SPITQGDRGV pcva vnelrenigo flppsggtnp lplpfoyyri PCVB VDMMRFNIND FLPPGGGSNP RSVPFEYYRI peptide 177

peptide 121

peptides 132 to 133

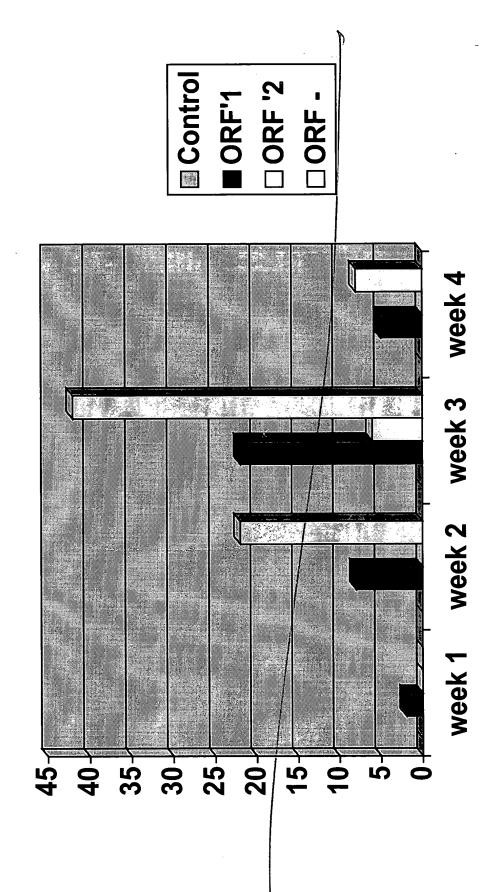
RYFTPKPVLD FTIDYFQPNN-KRNQLWLRLQ TAGNVDHVGL GTAFENSIYD DPYINYSSRH TIROPETYHS RYFTPKPELD OTIDWFOPNN KRNOLWLHLN THINVEHTGL GYALONATTA peptide 208 povB DPYVNYSSRH TITQPFSYHS 150 151 pcvA

235

peptide 152

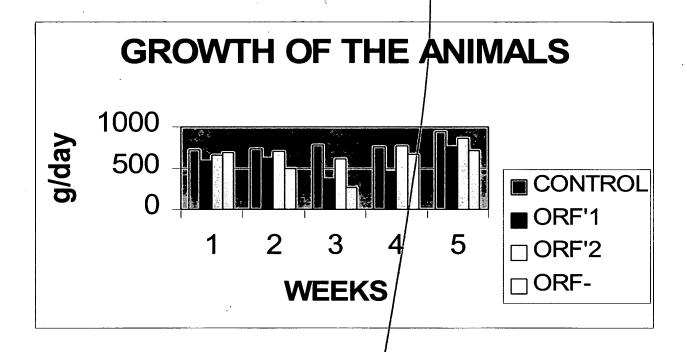
P.LNE PPLNP pcvA QNYVVRLTIY VQFREFILKD VQFREFNFKD pevB QEYNIRVTMY FIGURE 13

Figure 14



Percent hyperthermia (> 40.5°C), Control (not vaccinated and not challenged), ORF'1 (vaccinated and challenged), ORF'2 (vaccinated and challenged), ORF- (not vaccinated, challenged)

Figure 15



Control (not vaccinated and not challenged), ORF'1(vaccinated and challenged) ORF'2 (vaccinated and challenged), ORF- (not vaccinated, challenged)

## Figure 16

Immunoperoxidase staining of PK15 cells at 24 h post-transfection with the pcDNA3/ORF'2 plasmid. Expression of PCV-B ORF'2 was confirmed by IPMA following incubation in the presence of the swine anti-PCV-B monospecific serum.

